



## SA-100 SUBWOOFER POWER AMPLIFIER HOOKUP & OPERATING INSTRUCTIONS

### INTRODUCTION

The SA-100 Subwoofer Amplifier is designed for use with the Niles NSW-8, an eight inch acoustic suspension subwoofer in its own in-wall enclosure. The combination, ideal for use with the Niles Blueprint Series™ In-Wall Loudspeakers, offers several advantages:

- **More Bass.** Conventional in-wall subwoofers have an inherent problem: they radiate up to 50% of their bass into the surrounding wall. This radiated sound is *out-of-phase* with the sound coming from the front of the subwoofer. This causes poor bass response and unpredictable sound. The Niles NSW-8 solves this problem by using an air-tight enclosure which eliminates the out-of-phase radiation. The result is more bass in your room and less "lost inside your wall".
- **Bass that's controlled.** As you know, conventional in-wall subwoofers radiate their sound not only into the listening room, but also into the room on the other side of the wall. Since the NSW-8 has an air-tight enclosure, the amount of bass that radiates into the adjoining room is reduced by 50%.
- **Bass that's smart.** The SA-100 Subwoofer Amplifier turns itself on when the music starts playing and shuts itself off when you're through listening. A front-panel level control allows you to set the amount of bass you want. A bypass button defeats the subwoofer without turning off the main speakers; the phase-reversal switch ensures the best sounding bass at any listening position. Status LED's for bypass, active and protection are provided.
- **Bass that's flexible and reliable.** The SA-100 amplifier can be driven by a pre-amp or directly from the speaker outputs of a receiver. A 100hz, 24 db/oct. crossover is built-in and allows the satellite speakers to be run full-range or with the bass frequencies removed. The SA-100 is a full-sized component and can stack with other equipment. The unit features high-current, discrete output circuitry backed up by a massive toroidal power supply. It can easily drive a second NSW-8 subwoofer if desired. The SA-100 is rated at 100 Watts RMS at 8 ohms; its output increases to 140 Watts RMS into two woofers (a 4 ohm load).

### INSTALLATION CONSIDERATIONS

The Niles in-wall subwoofer system is made up of three parts:

#### NSW-8 Enclosure

This is the sealed box that is framed into the wall during construction. It is designed to fit between standard wood studs that are on 16" centers. The enclosure measures 14" Wide x 45" High x 3 1/4" Deep and is constructed of vinyl-clad Medium Density Fiberboard (MDF). The mounting bracket for the frame/baffle assembly is included with the enclosure and is already attached to it. Refer to the instructions included with the NSW-8 enclosure for its specific installation procedure.

## INSTALLATION CONSIDERATIONS (Con't)

### NSW-8 Baffle, Frame and Grill Kit

The baffle, frame and grill are installed after the drywall installation. The frame attaches to the bracket already on the enclosure; the NSW-8 subwoofer baffle is then screwed into the frame. A metal or cloth grill fits into the frame, covering the baffle. Refer to the instructions included with the NSW-8 baffle, frame and grill kit for the specific installation procedure.

### SA-100 Subwoofer Power Amplifier

The SA-100 should be located near the source components. It connects to either the variable line-level output of a pre-amp or directly to the speaker-level output of a receiver. Each NSW-8 subwoofer is connected to the SA-100 with 2-conductor speaker wire. For runs less than 30 feet, 18 gauge wire is sufficient; use 16 gauge (or larger) for runs between 30-100 feet and 14 or 12 gauge for runs over 100 feet. The SA-100 has a 3-wire grounded power cord and requires 120v AC at a maximum of 400 watts. As with any audio amplifier, locate the SA-100 in an area with adequate ventilation.

## FEATURE DESCRIPTION

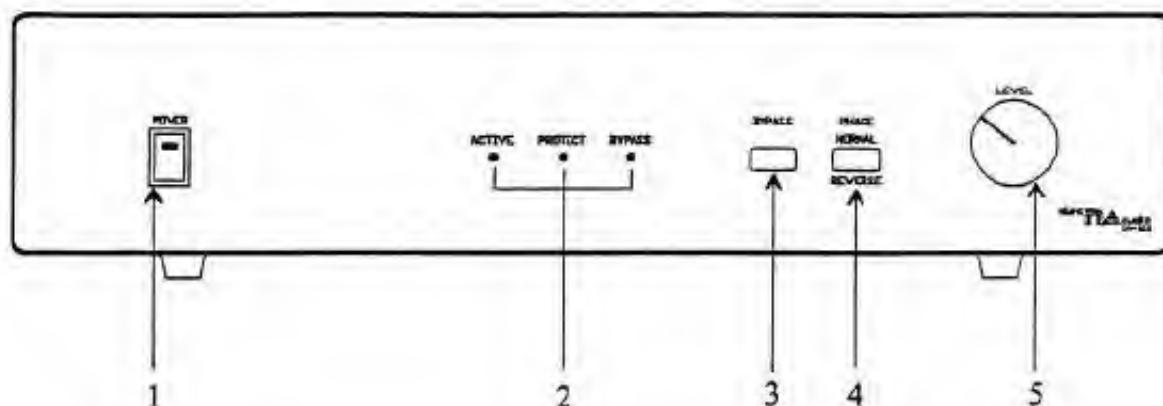


Figure 1

### 1. Power Switch

Turns the 110 volt line power to the amplifier on or off. This switch should normally be left in the ON position (see note below). LED indicator confirms presence of 110 volt line power.

**Note:** The SA-100 features automatic turn-on circuitry. The unit turns on when an audio signal is present at the MAIN IN or SPEAKER LEVEL inputs. It turns off approximately 2 minutes after a signal is no longer detected. The automatic turn on circuit will function only if the power switch is left in the ON position. Leave the power switch in the ON position if you want to use the automatic turn-on feature.

### 2. Status LED's

Active - Lights when the automatic turn-on function is activated and indicates normal operation.

Protect - Indicates when the amplifier is in DC or short-circuit protection.

Bypass - Indicates when the amplifier is in the Bypass mode (see #3 Bypass Switch).

### 3. Bypass Switch

Disables the subwoofer output. When the BYPASS mode is selected, the ACTIVE LED turns off and the BYPASS LED turns on.

**Note:** When in the bypass mode, the HI PASS OUT signal will be converted to a full-range output. This allows an accurate comparison of how the system sounds without the subwoofer.

### 4. Phase Switch

Reverses the polarity of the subwoofer output. This allows the listener to compensate for phase cancellation (also known as standing waves or room modes). The correct setting for this switch is the one that results in the best sounding bass at the listening position.

### 5. Level Control

Adjusts the output level of the subwoofer relative to the main speakers. The rear-panel GAIN adjustment affects the range of this control (see #10 Gain Adjust).

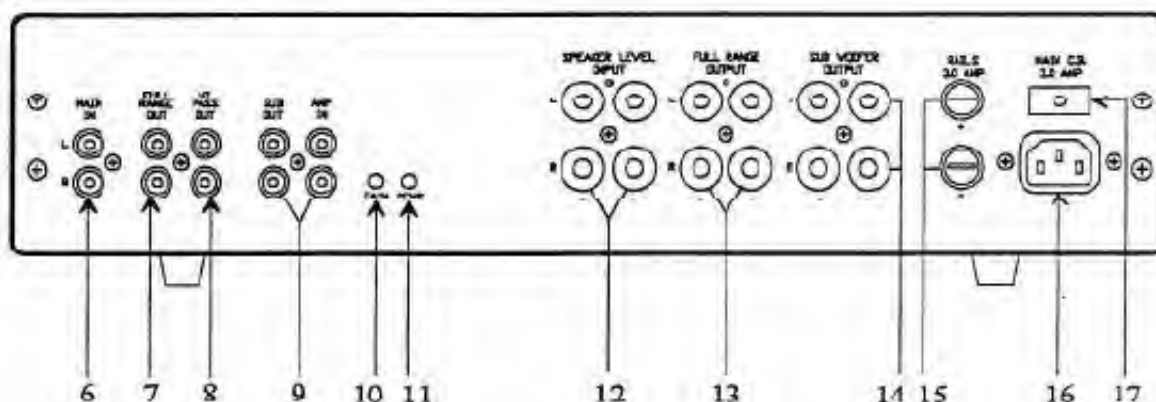


Figure 2

### 6. Main In

Line-level audio input. Connects to a variable line-level output of a pre-amplifier or receiver.

### 7. Full Range Out

Line-level audio output. This output is a "pass-through" type and is not affected by the SA-100 crossover; it is identical to the signal fed to the MAIN IN. If you want the main speakers to play full-range (including the low bass), connect the FULL RANGE OUT to the audio input of the amplifier or receiver for the main speakers.

**Note:** Large bookshelf speakers and most floor-standing speakers can provide additional bass for the system if you connect the amplifier driving them to the FULL RANGE OUT.

### 8. Hi Pass Out

Line-level audio output. This output has the bass frequencies below 100Hz removed. If you want the main speakers to play without the low bass, connect the HI PASS OUT to the audio input of the amplifier or receiver for the main speakers.

**Note:** Small bookshelf speakers and most in-wall speakers will sound better and have more dynamic range if you connect the amplifier driving them to the HI PASS OUT.

## 9. Sub Out - Amp In

Provided for connection of the Niles ALC-2M Audio Level Control (optional). The ALC-2M is a voltage-controlled line-level audio attenuator. When connected to the SUB OUT - AMP IN jacks on the SA-100, the ALC-2M allows the volume of both the subwoofer and the main speakers to be adjusted from a remote room location. The remote volume adjustment is accomplished by a wall-mount control, the ALC-2R. The ALC-2R is installed in the remote room location and is connected to the ALC-2M with 4-conductor shielded cable. Refer to Figures 7 and 8 for complete installation instructions.

**Note:** The ALC-2M/ALC-2R allow the volume of the subwoofer and the main speakers to be adjusted from a remote room location. They are recommended for use with the SA-100 when the subwoofer and the main speakers are located in a different room than the SA-100. If you choose not to use the ALC-2M/ALC-2R with the SA-100, the subwoofer level can only be adjusted by the LEVEL control on the front of the SA-100.

## 10. Gain Adjust

The GAIN ADJUST changes the input sensitivity of the SA-100. It compensates for a component connected to the SA-100 with too low or too high of an output level. Turning the GAIN ADJUST clockwise increases the sensitivity and turning it counter-clockwise decreases it. Examples of using the GAIN ADJUST:

- The front-panel LEVEL control has to be turned up nearly all the way for adequate bass output (incoming level is too low)
- The front-panel LEVEL control has to be turned down nearly all the way, otherwise there is too much bass output (incoming level is too high)
- You wish set the maximum level that the bass output can reach, even if the front-panel LEVEL control is turned all the way up.

Refer to the section titled "Adjustment Procedure" on Page 9 for the GAIN adjustment procedure.

## 11. Sensitivity Adjust

The SENSITIVITY ADJUST changes the amount of input level needed to trigger the auto turn-on function. The threshold may be set anywhere between 15 mv and 200 mv for line level audio signals and .15 watt to 3 watts for speaker-level signals. Turning the SENSITIVITY ADJUST clockwise increases the turn-on sensitivity, lowering the trigger threshold. Turning the SENSITIVITY ADJUST counter-clockwise decreases the turn-on sensitivity, increasing the trigger threshold.

**Note:** The factory setting of the SENSITIVITY ADJUST is maximum (fully clockwise). If you want the SA-100 to turn on at the slightest input level, leave the control at this setting.

## 12. Speaker Level Input

Connects to an unused speaker output of a receiver or amplifier. The SPEAKER LEVEL INPUT is provided in the event a variable line-level output of a pre-amplifier or receiver is not available.

## 13. Full Range Output

Speaker-level audio output. This output is a "pass-through" type and is not affected by the SA-100 crossover; it is identical to the signal fed to the SPEAKER LEVEL INPUT.



#### 14. Sub Woofer Output

Connects to the subwoofer. A second output is provided for an additional subwoofer.

#### 15. Fuses

3.0 Amp, 250 Volt fast-blow fuses protect the SA-100's output section. Replace only with fuses of the same type and rating.

#### 16. AC Cord Socket

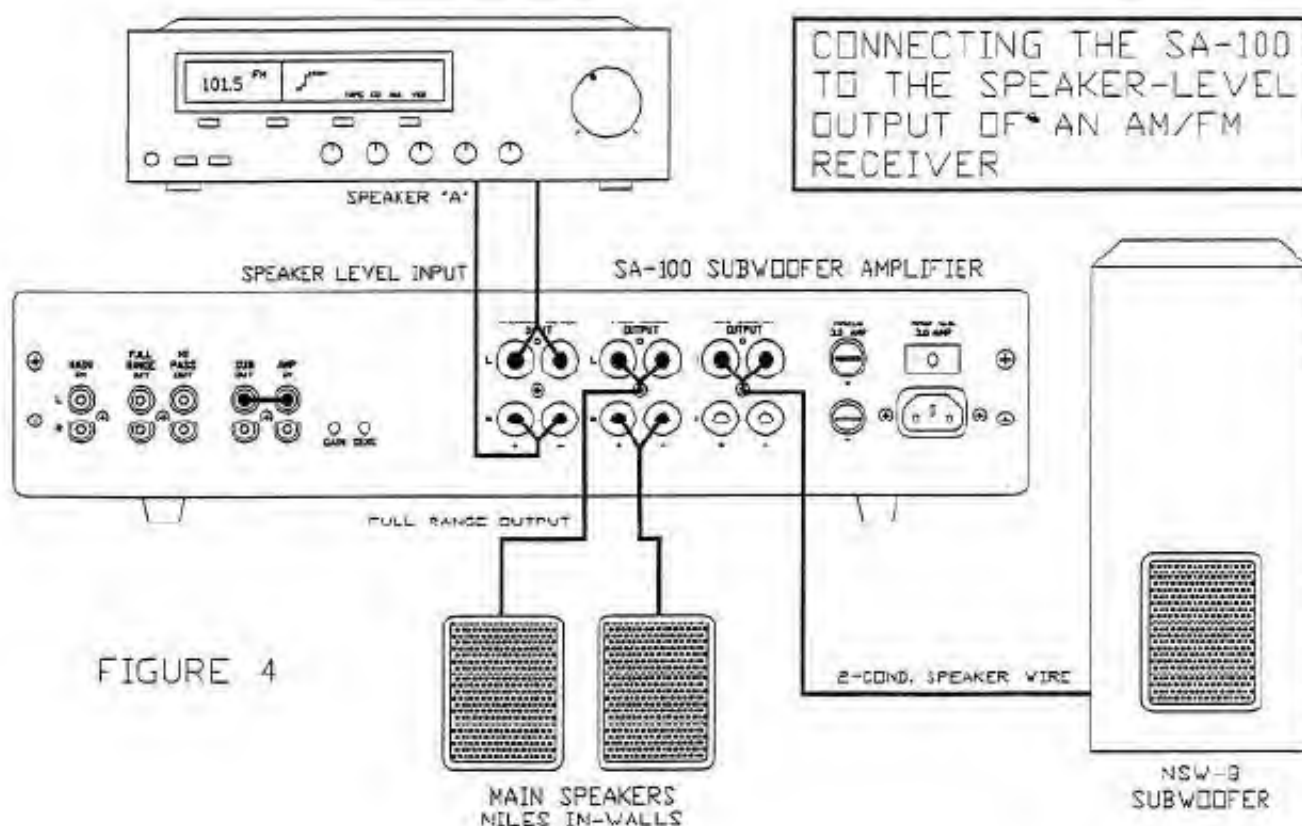
Connects to a 3-prong grounded 7.5 foot AC cord.

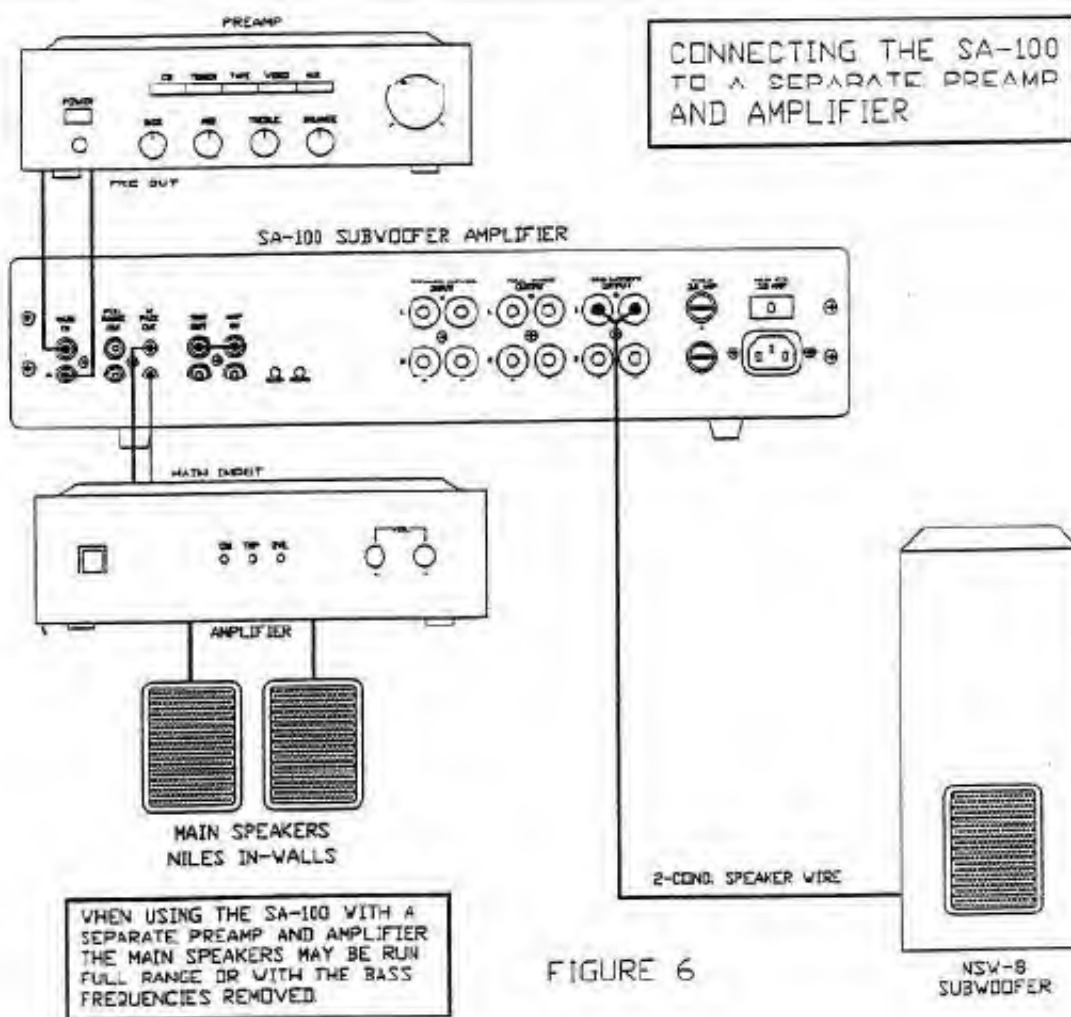
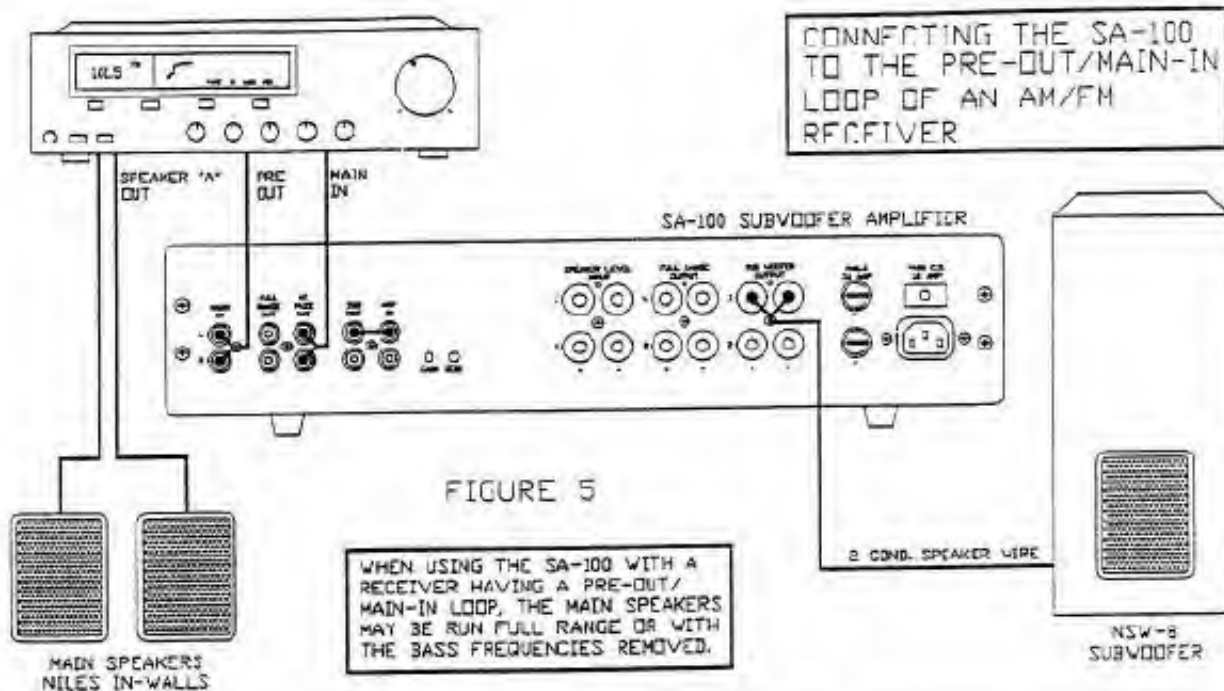
#### 17. Main Circuit Breaker

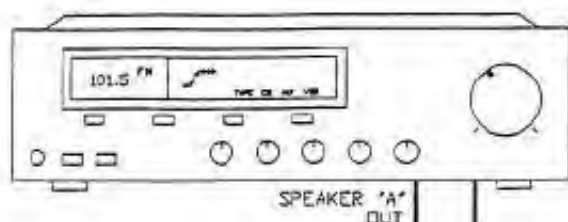
Trips in the event of an overload condition. Resets by pressing the button in.

## CONNECTIONS

The connections for the SA-100 will vary depending on the system's configuration. Figures 4 through 8 show possible system configurations.







USING THE SA-100, ALC-2M, AND ALC-1R WITH AN AM/FM RECEIVER TO ALLOW THE BASS LEVEL TO BE ADJUSTED FROM A REMOTE ROOM LOCATION

# SA-100 SUBWOOFER AMPLIFIER

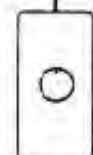
MAIN ROOM

## NOTES:

1. WHEN USING THE SPEAKER-LEVEL INPUT OF THE SA-100, THE ALC-2M WILL ONLY ADJUST THE LEVEL OF THE SUBWOOFER AND NOT THE MAIN SPEAKERS.
2. USE THE ALC-1R REMOTE LEVEL CONTROL WITH THE ALC-2M WHEN DRIVING THE SA-100 AT SPEAKER (FIVE)

FIGURE 7

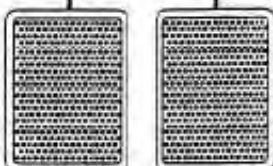
2-COND. SHIELDED



ALC-1R  
REMOTE  
AUDIO  
LEVEL  
CONTROL

AC ADAPTER  
(SUPPLIED  
WITH ALC-2M)

ALC-2M  
AUDIO LEVEL  
CONTROLLER



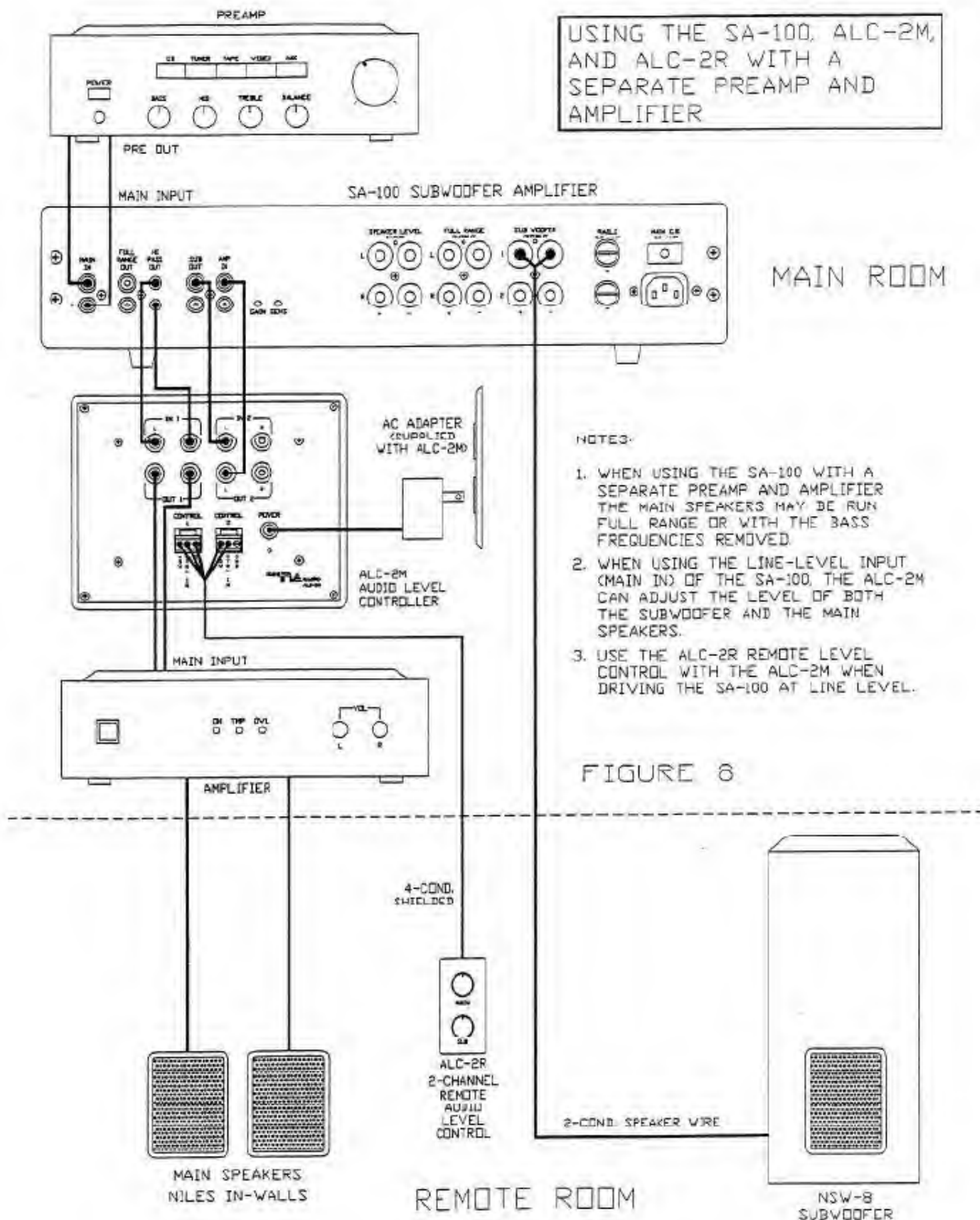
MAIN SPEAKERS  
NILES IN-WALLS

2-COND. SPEAKER WIRE

REMOTE ROOM



NSW-8  
SUBWOOFER





## ADJUSTMENT PROCEDURE

Do not turn on the SA-100 until all connections are finished.

1. With the SA-100 LEVEL control turned all the way down, turn the SA-100's POWER switch on.
2. Verify that the BYPASS switch is not depressed.
3. Turn on the source equipment connected to the SA-100. You should hear the source playing through the main speakers. Adjust the volume to the lowest audible level. This is the level that will be used to trigger the SA-100 to turn on.
4. The ACTIVE LED on the SA-100 will light when the automatic turn-on function is activated. If the ACTIVE LED is not lit, adjust the SENSITIVITY control on the rear of the SA-100 clockwise until the ACTIVE LED turns on.
5. Adjust the volume of the source to a typical listening level.
6. Adjust the SA-100 LEVEL control to set the amount of bass desired.

**Note:** Some systems may require the GAIN control on the rear of the SA-100 to be adjusted. You need to set the GAIN ADJUST if:

- A. The front-panel LEVEL control has to be turned up nearly all the way for adequate bass output. This indicates that the level of the incoming audio signal is too low. This can be corrected by increasing the input sensitivity of the SA-100. With the source playing at the desired listening level, set the LEVEL control on the front of the SA-100 to the 12 o'clock position. Adjust the rear-panel GAIN control clockwise until adequate bass output is achieved.
- B. The front-panel LEVEL control has to be turned down nearly all the way, otherwise there is too much bass output. This indicates that the level of the incoming audio signal is too high. This is corrected by decreasing the input sensitivity of the SA-100. Adjust the rear-panel GAIN control counter-clockwise so that normal bass output is achieved when the LEVEL control on the front set to the 12 o'clock position.
- C. You wish to set the maximum level that the bass output can reach, even if the front-panel LEVEL control is turned all the way up. With the source playing at the loudest listening level desired, adjust the rear-panel GAIN control so that the maximum setting of the LEVEL control does not cause the bass limit to be exceeded.

## OPERATION

1. Turn on the source equipment. The SA-100 will automatically turn on when audio is detected.
2. Adjust the LEVEL control to set the amount of bass desired.
3. Set the PHASE SWITCH to the setting that results in the best sounding bass at the listening position. The effect of the switch will vary depending on the room's acoustics.
4. When finished listening, turn off the source equipment. Leave the SA-100's POWER switch on. If no audio is detected, the unit will turn itself off after several minutes.

## SPECIFICATIONS

### SA-100 Subwoofer Power Amplifier

|                       |  |
|-----------------------|--|
| Power Output          | 100 Watts RMS into 8 ohms at less than .05% THD<br>140 Watts RMS into 4 ohms at less than .10 % THD<br>Both ratings from 20 Hz to 100 Hz |
| Frequency Response    | Bandwidth limited from 20 Hz to 100 Hz   |
| Signal-to-Noise Ratio | > 90 db  |
| Crossover Frequency   | 100 Hz @ 24 db/octave  |
| Connectors            | Gold-plated RCA jacks<br>5-way speaker wire binding posts  |
| Power Requirements    | 120 VAC 60 Hz @ 400 Watts maximum<br>3-wire grounded cord  |
| Overall Dimensions    | 17" Wide x 3 7/8" High x 12" Deep  |
| Weight                | 21 lbs.  |

### NSW-8 Enclosure

|                    |   |
|--------------------|---|
| Overall Dimensions | 14.25" Wide x 15" High x 3.25" Deep           |
| Composition        | 1/2" Medium Density Fiberboard, Vinyl Wrapped |
| Weight             | 24 lbs.                                       |

### NSW-8 Baffle, Frame and Grill Kit

|                    |                           |
|--------------------|---------------------------|
| Speaker Type       | 8" acoustic suspension    |
| Frequency Response | 38 - 100 Hz +/- 2 db      |
| Frame Dimensions   | 10.25" Wide x 14.25" High |